Genetic diversity and variability among pigmented rice germplasm using molecular marker and morphological traits

ABSTRACT

Exploring the genetic aspects of germplasm using genotypic and phenotypic analysis is more reliable for the development of rice varieties that could lead to the attainment of food security. This is because genetic variations provide a space for recombinants, which is an important factor in new varietal development. This study was conducted to evaluate genetic variability and diversity among 32 coloured rice accessions using agro-morphological characteristics and simple sequence repeats (SSR) markers. Quantitative traits (morphological, grain quality and antioxidant properties) and 34 SSR molecular markers were used as tools for determining cultivar identities and genetic diversity. Most of the quantitative traits showed significant differences ($p \leq 0.01$) among all rice accessions. Clustering analysis from quantitative traits categorised the accessions into four groups. Similarly, the 32 accessions were grouped into 4 cluster groups based on the analysis of 34 SSR markers. The accessions YTM15, Pulut Merah 3, Padi Randau, Ringan Bawang, DNJ128 and DV 107 can be potentially selected for development of new varieties for local cultivation. Finally, these accessions can be used as parents in further breeding programmes.

Keyword: Coloured rice; Grain quality; Quantitative traits; Genetic diversity; Simple sequence repeat (SSR)